

MARYLAND DIVISION OF LABOR AND INDUSTRY

MARYLAND FACE PROGRAM

CASE: 96MD03801

SUBJECT: An operator dies of crushing injuries when caught between bridle rollers of a hot dip coating line.

SUMMARY

A 50-year-old male operator died of crushing injuries, to the head, left shoulder and arm, when he became caught between bridle rollers of a hot dip coating line. There were no eye witnesses to the incident. It appears that the victim was wiping down rollers, an established practice when they observe defects on the metal being processed. This task is accomplished by tying a shop rag to the end of a broom handle and running it across the rollers, while the line is running. It is unknown how the victim became caught between the bridle rollers. The Cold Processor found the victim, who was looking for process defects reported by the Delivery Processor. As he was walking from the process entry section of the line, toward the end of the line, the Cold Processor saw the victim caught between #6 and #7 rollers of the #7 bridle. He immediately hit the emergency stop button. The victim fell backward out of the line. When the Turn Foreman arrived the victim had no pulse and was not breathing. The Medical Examiner pronounced the victim dead at the scene.

The Maryland FACE Field Investigator concluded that, to prevent similar occurrences employers should:

- ◆ *Shut down the process to clean the rollers.*
- ◆ *Enforce lockout /tagout procedures.*
- ◆ *Install barrier guards where personnel are exposed to in running rolls.*
- ◆ *Develop a specific written procedure that permits cleaning of the rollers without placing the employee in a hazardous position.*

INTRODUCTION

On July 27, 1996, at approximately 1:00 A.M., a 50-year-old male operator (the victim) died of crushing head injuries, when he became caught between a set of bridle rollers on a hot dip coating line. The victim had 32 years of service with the company and ten years in his current position. He had worked on this product line since its start-up in 1992. A MOSH Preliminary

Report on July 29, 1996 notified the MD/FACE Field Investigator of the incident.

Information regarding the incident was gathered from two on-site visits, by the Field Investigator conducted on August 1 and 2, 1996. Present at the interviews were union representatives, the general foreman, the line foreman and the senior safety supervisor. Supplementary information was gathered from the MOSH Inspectors report and the Medical Examiner's Post Mortem Examination Report.

The employer is a steel manufacturing facility that has been in business for more than 100 years. Approximately 5500 employees work at this location. Most operations run 24-hours-a-day, seven days a week. Five employees per shift, and support personnel operate the coating line.

The employer has a comprehensive safety program, with strong labor/management involvement. A strict personal protective equipment program is in effect. Minimum requirements are hard hats, safety glasses and safety shoes. A Job Safety Analysis program covers many tasks. However, they documented no written instructions or procedures for the task it is assume the victim was doing. Training programs are documented and they require lockout/tagout training for everyone in the plant.

INVESTIGATION

The victim's shift started at 11:00 P.M. on July 26, 1996. He was the Operator on the coating line. This line can produce two types of products. The first are galvanized steel sheet coils. The second are galvalum steel sheet coils; a 55% aluminum and galvanize mixture. Galvalum is the product that was being run at the time of the incident and is more subject to producing flaking defects than galvanize. The line has the capacity to produce 260,000 tons a year, in widths ranging from 24 to 29 inches and in thicknesses of .0100 to .0600 inches. Process speed of the line is 650 feet-per-minute. The length of the line is 725 feet, with approximately 3500 feet of strip in line. Nine sets of bridge rollers, positioned at various intervals throughout the line. The function of the bridge roller is to hold tension on the product during the coating processes.

Early in the shift the line began to experience dents in the steel strip product being produced. Debris sticking to the rolls causes the dents in the process line. The victim and his foreman cleaned the rolls using a broom handle with rags attached to one end, wiping the rag across the face of the roller. This is a common process called, "Q-tipping." At approximately 12:30 A.M., July 27, 1996, the Delivery Processor, noticed defects in the strip, as the product came into his area. His work station is at the end of the coating line, where they wind the finished product into a large coil. Using the intercom speaker system, he requested that someone check the line to detect where the defects were occurring.

The Cold Processor, who was at the starting end of line, began to walk toward the finish end of the line looking for the area causing the problem. As he approached the #7 bridge area, he saw the victim caught between the #6 and #7 rollers. He immediately pushed the emergency stop button near the Temper Mill Pulpit (control room). When the line was stopped, the victim fell

backward to the floor. The Turn Foreman responded to the scene and found the victim with no pulse and not breathing he had crushing injuries to his head, left shoulder and arm. He called the ambulance, which arrived within 10 minutes. The ambulance crew decided to call the Medical Examiner, based on their assessment of the incident. The Medical Examiner reported the fatality to MOSH at 2:01 A.M.

Upon close examination of the scene, investigators found pieces of wood, rags and the victim's safety glasses in the area between #6 and #7 rollers of #7 bridle. Evidence at the scene suggests that the victim was using a broom handle with a shop rag tied to one end and was Q-tipping the rollers, while the line was running. This process removes "flakes" from the rollers that cause "dents" or surface imperfections to the finished product. To swab the rollers the victim had to step up approximately twenty-two inches onto an eight-inch wide concrete ledge and position himself next to #6 and #7 rollers of #7 bridle. The distance between the surfaces of these in running rollers is approximately four inches. The center line of these rollers is approximately four feet six inches above the ledge on which the victim may have been standing. Each roller in #7 bridle is sixty inches wide and thirty inches in diameter.

CAUSE OF DEATH

The Medical Examiner determined that the cause of death was the result of crushing injuries to the head, left shoulder and arm.

RECOMMENDATION/DISCUSSIONS

Recommendation #1: Employers should shut down the process to clean rollers.

Discussion: Cleaning in running rollers of any size while they are running is a dangerous procedure. The distance between the bridle rollers may have given the illusion that the bite or nip points between the rollers did not exist. However, due to their size and the speed at which they rotate, they should consider shutting down the process to clean the rollers, or find an alternate method to accomplish the same task. If shutting down the process is not practical, they should develop an alternative mechanical process. They should develop and enforce specific written instructions, prohibiting employees from reaching into moving machinery with any part of their body or with any tool that may be caught in the rotating equipment.

Recommendation #2: Employers should enforce lockout/tagout procedures.

Discussion: No provisions within the employer's, "start permissive procedures," consider lockout/tagout of the line. Investigation reveals that the employer feels that the computer controlled protocols, which they must follow that started the line, had a measure of safety equal to their lockout/tagout procedure. However, before commencing service on any piece of equipment, employees should make certain all hazardous energy sources are off or neutralized

and properly lockedout and tagged out. Lockout/tagout provisions of 29CFR1910.147 are applicable when, "An employee is required to place any part of his or her body into an area on a machine or piece of equipment where work is actually performed...".

Recommendation #3: Install barrier guards where personnel are exposed to in running rolls.

Discussion: A barrier guard should be installed so persons cannot normally reach through, over, under, or around to come in contact with the roll bite or become caught between in running rolls or a roller and an adjacent object. Machine guarding is required by 29CFR1910.212, "...to protect the operator and other employees in the machine area from hazards such as those created by point of operation, ingoing nip points, rotating parts...". At the time of the investigation the employer had installed a barrier guard at the site of the accident.

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FATALITY ASSESSMENT AND CONTROL EVALUATION

The Maryland Division of Labor and Industry administers the Fatality Assessment and Control Evaluation (FACE) Program under a cooperative agreement with the National Institute for Occupational Safety and Health, Division of Safety Research (NIOSH/DSR). The Maryland FACE Program performs Investigations of selected occupational fatalities, prepares summary reports, and engages in prevention activities. The goal of our program is to prevent fatal work injuries in the future by studying the working environment, the worker, the task being performed, the tools employed, the energy exchange resulting in fatal injury, and the role of management in controlling how these factors interact.

NIOSH/DSR developed the FACE research protocol in the early 1980's and continues to perform FACE investigations. To increase the research and prevention activities of NIOSH/DSR, states across the nation have been invited to participate in the State FACE Project. Maryland and thirteen states listed below currently participate in the State Based FACE Project: Alaska, California, Colorado, Iowa, Indiana, Kentucky, Massachusetts, Minnesota, Missouri, Nebraska, New Jersey, Wisconsin, and Wyoming.

Additional information regarding this report or the Maryland FACE Program is available from:

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